17th Meeting of the GOR Working Group
Pricing & Revenue Management

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The 17th annual meeting of the working group "Pricing and Revenue Management" took place in Munich on the 7th of February and was hosted by FlixMobility GmbH. The unique mobility and tech start-up opened its doors for the 120 participants of the working group meeting. As in recent years, the number of requests for participation exceeded the capacity limit of the conference venue, which demonstrates the significance of revenue management issues on one hand and shows the attractiveness of the event format that brings together researchers and executives as well as practitioners from industry on the other. To also address international participants, the conference language was English, and we were able to welcome executives from all around Europe who represented their companies from many different industry branches. The participants originated, e.g., from the airline industry, travel and tourism companies, mobility and logistics providers, software providers, consulting companies as well as from household appliance manufacturers and companies of the chemical industry. Furthermore, eight universities were represented by the audience. The overarching topic of interest that our speakers chose independently and that participants showed special interest in was the use and potential of artificial intelligence for revenue management purposes.

The first talk of the day, entitled "*The Vision of a RM System for Flix & Challenges of a Rapidly Growing Company*", was held by *Matthias Kuhn*, Managing Director at *FlixTrain* and Vice President Pricing and Network at *FlixBus*, and *Dr. Carla Amman*, Head of Pricing Excellence at *FlixMobility* and long-term member of the working group. Both welcomed the participants and introduced their dynamically and fast growing company, its development since the start in 2013 as well as the vision and future targets of FlixMobility. Starting off as a small company with manual price steering, FlixMobility constantly faces the obstacles related to the fast growth of the company. The speakers introduced some of the issues and how they tackled them while aiming at an revenue management organization in which revenue managers do not set all prices manually but rely on an automated system. More precisely, in the current system, part of the network is fully automated with only high-level supervision, while the part that creates most revenue is manually steered. They also discussed the efforts in change management that are required due to the shift of paradigm from "steering the lines" to "steering the machine".

The second talk of the day, entitled *"Challenges of Revenue Management in a Fast Growing Cruise Industry"*, also focused on the problems of how to evolve from manual price steering towards a revenue management organization based on steering and optimizing an automated revenue management system, also in a fast-growing market but in an industry with totally different customer behaviour. *Katharina Rinne*, Director Revenue Management & Pricing, and *Benjamin Juds*, Head of Revenue and Yield Management of *TUI Cruises*, discussed the general particularities of revenue management in the cruise industry. Moreover, they explained the challenges and opportunities they are facing due to the fast expansion of their own capacities and also due to changing customers' booking behaviour, and how these developments impair their transformation towards an automation-based revenue management.

After a networking break, the second session was dedicated to dynamic pricing in retail. The first talk of the session, entitled *"Dynamic Pricing on Online Marketplaces – Theory and Applications"*, was given

by *Dr. Rainer Schlosser* from the *Hasso-Plattner-Institute* of the University of Potsdam. In the project presented, he applied data-driven demand learning techniques to the use-case of a large merchant of used books at amazon marketplace and tested the results of regression models and machine learning techniques within a simulated marketplace environment with good results. Regarding price optimization, he presented a dynamic programming-based heuristic approach which achieved an increase of profits compared to the merchant's rule-based strategy of more than 23%.

The second talk of the session, entitled "*From Rapid Prototyping to Permanent Prototyping – A Modular Approach to Dynamic Pricing in E-Commerce*", was given by *Dr. Fabian Uhrich*, Associate Director Sales & Pricing at the *Boston Consulting Group*. He shared his experience of introducing an automated pricing tool at a major e-commerce company. He explained why a stand-alone artificial intelligence tool with intransparent decision making cannot be the solution to setting dynamic prices. Instead, he introduced what he calls 'augmented intelligence', an automated pricing tool with transparent pricing logics and manual steering options and stresses the importance of introducing it piecewise to the organization and to integrate it in and align it with the business processes of the company.

The first talk of the afternoon, entitled "*How Much to Tell Your Customer? – An Overview of Selling Strategies with Incompletely Specified Products*", was held by *Prof. Dr. Jochen Gönsch* from the *University of Duisburg-Essen*, who gave the audience a literature overview of incompletely specified products that find application in various industries from travel and tourism to high tech products. He examined different streams of research: strategic operations management, the empiric research community and literature deriving from the operations management community. Also, he demonstrated the potential benefits for companies when offering such products, and the implications on traditional revenue management.

Subsequently, *Dr. Henrik Imhof*, Senior Vice President Yield Management and Pricing at *SIXT* and Co-chair of the working group, gave a talk entitled "*Analytics and AI in Revenue Management*". First, he

discussed how the traditional revenue management problem can be decomposed into the calculation of opportunity cost on the one hand and offer/price optimization on the other. Thereby, he also demonstrated the high error sensitivity if the first is not properly accomplished. Second, relying on this decomposition, he discussed how the two components can be supported by machine learning and AI approaches, respectively. Then, he presented a couple of studies in a stylized revenue management setting, demonstrating the convergence of an approximate dynamic programming approach's outcome towards the optimal values.

In the last talk of the day, entitled *"The Airline Pricing Problem"*, *Dr. Jonas Rauch*, Senior Manager Revenue Management Strategy and Development at *Deutsche Lufthansa AG*, presented a theoretical work originating from his doctoral thesis. He proposed an integrated dynamic pricing and availability control program, which not only optimizes prices but, simultaneously, also the segmentation criteria. Customer choices are incorporated by a flexible demand model based on individual utility choice and are evaluated numerically. In his computational study, he demonstrated the difficulty to find a global optimum, given the non-convexity of the problem with many local optima. A heuristic extension to the network case showed good results with regard to overall revenue.

At the eve of the conference, an informal pre-conference dinner took place at the traditional Munich restaurant *Augustiner zum Ewigen Licht,* with more than half of the meeting participants taking the opportunity to network and meet old colleagues and friends.

We thank FlixMobility GmbH for hosting this year's successful event and cordially invite all interested "Pricing & Revenue Management" enthusiasts to attend one of our upcoming meetings. The next meeting will take place in spring 2021.